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IS 3209 (1989): Engineers' Drawing Instruments - Spring Bow Compasses [PGD 22: Educational Instruments and Equipment]



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“Knowledge is such a treasure which cannot be stolen”

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Indian Standard

**ENGINEERS' DRAWING INSTRUMENTS—SPRING
BOW COMPASSES—SPECIFICATION**

(First Revision)

भारतीय मानक
इंजीनियरी ड्राईंग उपकरण—स्प्रिंग
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FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards on 1 November 1989, after the draft finalized by the Optical and Mathematical Instruments Sectional Committee had been approved by the Light Mechanical Engineering Division Council.

Spring bow compasses is a drawing instrument used by draftsmen and engineers to draw small circles and mark off equal distances with greater accuracy, the screw permitting easy and positive setting of distances.

This standard was originally published in 1965. This revision is based on further experience gained in the manufacture of drawing instruments and other development in this field.

The main modifications are:

- a) Tolerances on important dimensions and mating parts have been specified.
- b) Overall length 110 approx has been modified as 110 ± 1 .
- c) Nominal size has been deleted and spring bow compasses will now be designated by its overall length instead of nominal size.

In preparing this standard due consideration has been given to manufacturing practices being followed in the country and assistance has been derived from DIN 58508-1976 Teilzirkel für Präzision — Rei Bzeuge (P), issued by the Deutsches NORMEN.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

ENGINEERS' DRAWING INSTRUMENTS—SPRING BOW COMPASSES—SPECIFICATION

(*First Revision*)

1 SCOPE

1.1 This standard covers the requirements of spring bow compasses for engineers' drawing instruments of the following types:

- a) Spring bow pen,
- b) Spring bow pencil,
- c) Spring bow divider, and
- d) Spring bow reversible pen-pencil.

2 REFERENCES

2.1 The following Indian Standards are necessary adjuncts to this standard:

<i>IS No.</i>	<i>Title</i>
2500 (Part 1) : 1973	Sampling inspection tables: Part 1 Inspection by attributes and by count of defects (<i>first revision</i>)
3216 : 1989	Engineers' drawing instruments, needles (<i>first revision</i>)
3222 (Part 1) : 1989	Instrument screws : Part 1 Fasteners for drawing instru- ments (<i>first revision</i>)
4827 : 1983	Electroplated coating of nickel and chromium on copper alloys (<i>first revision</i>)

3 MATERIAL AND HARDNESS

3.1 The material for manufacture of spring bow compasses shall be rolled, drawn or cast brass (B), nickel silver (Ns) and stainless steel (Ss).

3.2 Suitable quality of spring steel shall be used for making the springs.

3.3 The drawing nibs shall be made from steel having a carbon content of 0.60 to 0.75 percent or suitable grade of stainless steel.

3.4 The drawing nibs of the spring bow pen shall have a minimum hardness of 230 HV.

4 DIMENSIONS

4.1 The dimensions for spring bow compasses with side screws and with centre screws shall be given in Fig. 1 and 2 respectively.

4.2 The dimensions for spring bow reversible pen-pencil shall be as shown in Fig. 3.

4.3 The figures are intended only to illustrate the dimensions and the design details are left to the discretion of the manufacturer so long as the specified dimensions are maintained.

5 DESIGNATION

5.1 Spring bow compasses shall be designated by the commonly used name, with side or centre screws, overall size, number of this standard and material.

Example:

Spring bow pencil with centre screw having a overall length of 110 mm and made from nickel silver (Ns) complete with needle and screws, shall be designated as:

Spring Bow Pencil, Centre Screw 110
IS 3209 — Ns.

6 GENERAL REQUIREMENTS

6.1 The spring bow compasses shall comprise of two legs; one with a pen, pencil, divider or reversible pen-pencil arrangement and the other leg with a needle.

6.2 Spring bow compasses shall be capable of being adjusted for drawing circle from 2 to 60 mm diameter.

6.3 The spring bow compasses shall be made with a C-shape top spring as shown in figures and with a side screw or centre screw.

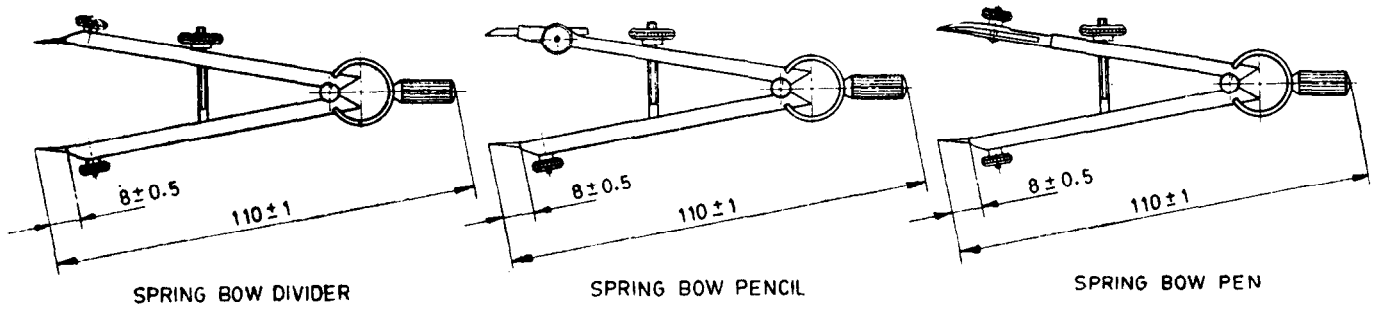
6.3.1 Spring bow reversible pen-pencil shall be made only with side screw.

7 WORKMANSHIP AND FINISH

7.1 The spring bow compasses shall be finished dull or bright.

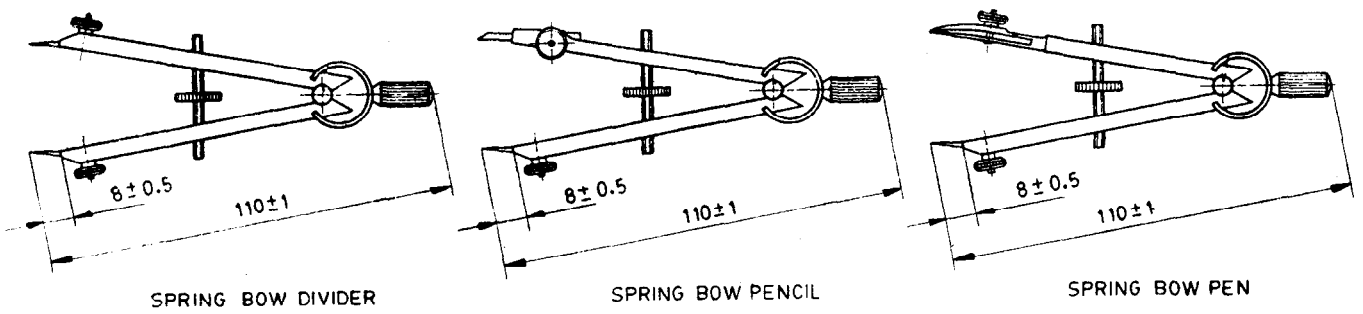
7.1.1 When these are made from brass, they shall be chromium plated to service Grade No. 1 according to IS 4827 : 1983.

7.2 The drawing nibs of the spring bow pen shall be hardened, tempered, polished and honed.



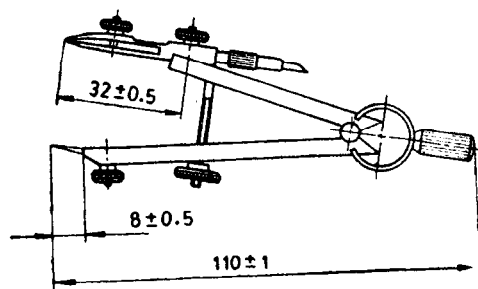
All dimensions in millimetres.

FIG. 1 DIMENSIONS FOR SPRING BOW COMPASSES WITH SIDE SCREW



All dimensions in millimetres.

FIG. 2 DIMENSIONS FOR SPRING BOW COMPASSES WITH CENTRE SCREW



All dimensions in millimetres.

FIG. 3 DIMENSIONS FOR SPRING BOW REVERSIBLE PEN PENCIL

8 NEEDLES

8.1 The needles shall conform to the requirements as specified in IS 3216 : 1989.

9 SCREWS

9.1 The different screws used with spring bow compasses shall conform to the requirements specified in IS 3222 (Part 1) : 1989.

10 SAMPLING

10.1 Lot

In a consignment all the spring bow compasses of the same designation manufactured from the same material under similar conditions of production shall be grouped together to constitute a lot.

10.2 Unless otherwise agreed to between the supplier and the purchaser, the procedure given in IS 2500 (Part 1) : 1973 shall be followed for sampling inspection. The inspection level, acceptable quality level (AQL) and type of sampling plan to be followed for various characteristics shall be as given in **10.2.1** and **10.2.2**.

10.2.1 For dimensions, designation, general requirements, and workmanship and finish, a single sampling plan with inspection level IV and AQL of 2.5 percent as given in Tables 1 and 2 of IS 2500 (Part 1) : 1973 shall be followed.

10.2.2 For performance test a double sampling plan with inspection level II and AQL of 2.5 percent as given in Tables 1 and 3 of IS 2500 (Part 1) : 1973 shall be followed.

11 TESTS

11.1 Dimensional Test

Spring bow compasses shall be tested for conformity with the requirements of dimensions specified in 4 and 4.1.

11.2 Hardness Test

The drawing nibs of the spring bow pen shall be tested for hardness specified in 3.4.

11.3 Spring bow compasses shall not show any noticeable backlash which may lead to visible errors because of the compass, after screwing and unscrewing 1 000 time of the springs bow compass.

12 MARKING

Spring bow compasses shall be marked with the manufacturer's name or trade-mark at a suitable place.

13 PACKING

13.1 Spring bow compasses shall be individually wrapped in paper and then packed in suitable cartons.

13.2 Spring bow compasses may also be supplied as part of an instrument set in which case the complete set may be supplied in a suitable box.

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